Progress of Astronomy in 1910

By Alfred Rordame.

THE year 1910 has been a year full of interest to the student of astronomy. The spectacular appearance of a comet visible even in daylight, which made its appearance in January, not to speak of the long anticipated visit of Halley's comet, are the events that will appeal most to the public at large.

Death has been busy this year in the ranks of the leading astronomers. In May astronomy was bereft of its leading amateur in the person of Sir William Huggins. His death was followed in rapid succession by those of Prof. Schiaparelli, and Galle, the veteran German observer. Now these have been followed by the death of another great amateur, Mr. J. E. Gore, one of the ablest of the present-day astronomers.

SIR WILLIAM HUGGINS.

Sir William Huggins was born in London, Feb. 7, 1824, and died May 12, 1910, having reached the ripe old age of 86 years and 3 months. He became interested in astronomy early in life, and his activity in his favorite science extended over more than 60 years. He was the founder of the "new astronomy" or astrophysics, as it is now called. In 1856 he purchased a house at Tulse Hill, near London, and here at great expense he equipped a first rate astronomical observatory. His first great discovery was made in 1864, that some of the nebulae were gaseous in their composition and showed a spectrum of bright lines. In 1868 he made the discovery that true motion of the stars in the line of sight could be measured by the spectroscope, and communicated this fact to the Royal society; but as usual when any great discovery is made by an amateur, his paper was received with incredulity. Sir William found it difficult to convince the said professional astronomers. Airy, the astronomer royal at Greenwich, and Struve of Pulkowa, were incredulous, while Sir Norman Lockyer made light of and opposed the new theory with all his power. Despite their opposition, however, the principle was soon firmly established and is now recognized as an unfailing law by astronomers.

GIOVANNI SCHIAPARELLI.

Schiaparelli, the greatest Italian astronomer of modern times, was born at Savigliano, in Piedmont, on March 14, 1835. In 1859 he was appointed assistant astronomer at the Brera observatory at Milan, where he made his first discovery, that of the asteroid Hesperia. In 1865 he announced the connection between meteors and comets. He showed that the Leonid meteor swarm moved in the orbit of the faint comet discovered by Tempel in 1865, and the August meteors in the same orbit as the bright comet of 1862. His popular fame rests on his famous discovery of the faint streaks on Mars, which he named canali, an Italian word which may be translated "channels," in 1877, and for nine years he was the only astronomer who saw the canals, and he was doubted on all hands, even though his skill as an observer was recognized. At length in 1886 Perrotin and Thollon at Nice observed the canals, and since that date they have been seen by a great many astronomers, chief among whom is Prof. Lowell, whose theory of their nature is well known in the astronomical world. Why so long a time should elapse before their existence was verified is incomprehensible to the present writer, who saw the canals well at the apposition of Mars in 1907, with a telescope of only 6½ inches aperture.

DR. J. G. GALLE.

Galle was born in Pabsthaus, Germany, June 9, 1812, and died July 10, 1910, at Potsdam, lacking less than two years of reaching the century mark. He like Schiaparelli was a professional astronomer, being appointed assistant to the famous astronomer Encke. He discovered three comets during the years 1839-40. His was the first human eye which beheld the planet Neptune. On Sept. 23, 1846, he received a letter from Leverrier, a young French mathematician, who wrote, "Direct your telescope to a point on the ecliptic in the constellation of Aquarius, in longitude 326 degrees, and you will find within a degree of that place a new planet, looking like a star of about the ninth magnitude, and having a perceptible disc." Galle found the planet within half an hour after he commenced his search, and as it presented a sensible disc, there could be no doubt that it was the object sought; but, desirous of proceeding with caution, he waited till the following night, when he found that it had actually changed its position among the stars.

J. E. GORE.

John Ellard Gore was born at Athlone, Ireland, on June 1, 1845, and died on the 18th of July, 1910. While crossing Grafton street, Dublin, Mr. Gore was run over and fatally injured by a car, and thus astronomy is bereft of a great student in much the same manner that chemistry was deprived of one of its noblest pioneers, M. Curie, of radium fame, by a similar accident four years ago. Mr. Gore's work was accomplished largely by the unaided eye and the opera glass. He discovered a number of new variable stars and was a prolific writer on astronomical subjects.

THE SUN.

The fourth conference of the International Union for Co-operation in Solar research, was held at the Mount Wilson Solar observatory, California, from Aug. 29 to Sept. 3, 1910, and 13 different countries and 50 different observatories and laboratories, where work is carried on in connection with the study of the sun, were represented. The progress of knowledge of the sun was presented in papers read by the most famous astronomers of our day. Prof. Hale described the tower telescope on Mt. Wilson, designed specially for solar research, which has an aperture of 12 inches and a focal length of 150 feet. With this telescope it is possible to take photographs showing the hydrogen flames and calcium flocculi, which float at high levels in the solar atmosphere. Investigations in solar radiation have been carried out as in past years at the Smithsonian Astrophysical observatory, and the most probable value of the solar constant of radiation appears now to be about 1.92 calorlis per square centimeter per minute. There appears to be a variation in this quantity of heat received by the earth of about 10 per cent, coincident with the solar spot period, being greatest at minimum. It is a well known fact, discovered in the early part of last century, that sun spots have a period of frequency of about 11 years in which they increase in size and number to a maximum and as regularly decrease to a minimum. This year being one of small sunspot frequency, no large or striking sunspots have been visible. The May group of sunspots was about the largest, and a drawing of this group was made by the writer and published in The Deseret News of May 19. It was central on the sun on May 18, and was mistaken by certain would-be teachers of astronomy for Halley's comet, which was scheduled to transit the sun on that date.

ALFRED RORDAME.

THE PLANETS.

The study of the major planets has been carried on as usual at observatories, public and private, all over the world, and our knowledge of these bodies is gradually being increased. The rotation period of Mercury and Venus is, however, still an open question. The weight of evidence seems to be in favor of the existence of water vapor in the atmosphere of Mars, giving it a climate comparable to that on a high mountain on the earth on a cloudless day. Signor Maggini of the Ximenian observatory, Florence, observed on Sept. 29, a luminous prominence on the western limb of the globe of Saturn, a very unusual occurrence on that quiescent planet.

COMETS.

Nowadays comets are usually "picked up" with the telescope or the photographic plate before any one except their discoverer is aware of their existence, and usually they remain so insignificant in appearance that only astronomers ever see them. Yet so great is the prestige of the word comet that the discovery of one of these wanderers in space, even though inconspicuous, is heralded in the daily press with other items of news. The journals in this way help to disseminate the knowledge that something unusual is going on, outside of our little earthly affairs.

Seven comets have been visible this year, of these, two were discovered in 1909, viz: Daniel's and Halley's. Comets are designated by letters in the order in which they were discovered, as well as by the name of the person making the discovery. Halley's was the fourth comet discovered in 1909 (Sept. 12, by photograph,) and would thus be designated Comet D, 1909. Daniel's comet, E, 1909 was never very bright, and was only observed by astronomers, the last recorded observation being made by Ramband at Algiers on March 3, 1910. Comet A 1910 was first seen by workmen at the railroad station Kopjes, Orange Free State, South Africa, Jan. 12, at 4:45 a.m., rising before the sun. After Jan. 17, it set after the sun and for a few evenings around Jan. 21 it rivaled Venus in brightness and like that star could be seen in broad daylight. Its brightness was due to its proximity to the sun, its perihelion being much closer to that luminary than Halley's, and its tail, about 20 degrees in length, at first straight, developed a curve towards the south. This comet had a parabolic orbit, and will never return to the gaze of mankind. On Aug. 8, a nebulous object, very faint, was picked up by J. H. Metcalf of Taunton, Mass., which proved to be a telescopic comet. This also moves in a parabolic orbit and is designated comet B 1910. It was nearest to us on July 1 and we may be able to observe it again next spring, though fainter than now, not visible to the naked eye. D'Arrest's comet was observed by M. F. Gonmissiat, director of the Algiers observatory, Aug. 26. This is a periodic comet accomplishing its revolution around the sun in six and one-half years and has been seen many times, only visible in large telescopes.

Profs. Wilson and Aitken at the Lick observatory on Sept. 28, picked up Brooks' periodic comet of 1889 with the great 36-inch telescope on its thirty-ninth return to the vicinity of the earth. The comet is exceedingly faint and quite small so that it may not be detected with moderate size telescopes.

News reaches us that Cerulli has observed the return of Faye's comet, another member of the Jupiter family of comets.

HALLEY'S COMET.

The return of Halley's comet and the anticipated passage of the earth through its tail on May 18, was the one astronomical event which captured the popular imagination. Exaggerated views of its magnitude filled the public mind, and the fact that it failed to leave any marks of its passage on our planet, was held in a measure to the discredit of astronomers. The real length of the tail of Halley's comet was never realized by the layman on account of its foreshortening; on April 21 it subtended an angle of 4 degrees with a real length of 9,200,000 miles which on May 5 had increased to 28 degrees, representing a length of 27,000,000 miles; on May 17 on the other hand, it subtended an agle of 105 degrees, while its real length was only 18,900,000 miles. On that morning the writer had the best view of the comet, the tail extending nearly half way across the heavens. On July 1 the comet again subtended an angle of only 4 degrees; but still having a tail 18,000,000 miles long. The reason the earth did not pass through the tail of the comet may well be that the earth, being a comparatively warm body, repels the minute particles of the comet's tail, in the same manner, though in a less degree, that the sun does.

TEMPORARY STARS.

Two new stars have been discovered, in 1910, both by Mrs. Fleming of the Harvard observatory staff, on plates taken at Arequipa, Peru, where the Harvard astronomers have a station. Unfortunately the length of interval since the taking of the plates and the measuring of the minute dots constituting the star images is, as in former cases, about six months, and the accumulation of plates are such that many of these stars cannot be visually observed. Of the 16 new stars found during the last 25 years 13 have been found at Harvard observatory, one by Miss A. J. Cannon, two by Miss H. L. Leavitt and 10 by Mrs. Fleming, all on photographic plates.

ECLIPSES.

There were four eclipses this year, two of the sun and two of the moon; a total eclipse of the sun May 9, which was visible in Australia and Tasmania, and to the last named place the Lick observatory sent an expedition, which failed to observe it on account of rain. The eclipse of the moon May 23, was one of great beauty, when Halley's comet shone out brilliantly in the western sky during totality. The partial eclipse of the sun Nov. 1 was only visible to part of Alaska and the Hawaiian Islands. Nov. 16 the moon rose eclipsed, and it was very interesting to note the gradual withdrawal of the moon from the earth's shadow as it rose in the sky.

The University of Utah

A Word about its Function, Organization, and Extent
Something of the Spirit Which Characterizes its Student Life

Function as Head of the Public School System.

The function of the University of Utah is to supply the higher educational needs of the State.

These needs constantly extend and broaden.

As old almost as the State, the University of Utah also enjoys the distinction of having grown up with the State. Today, sixty years since the founding, it is a modern American University, offering the attractions and advantages which a modern American commonwealth demands.

Organization.

The University of Utah at present comprises a group of four schools. They are the School of Arts and Sciences, the School of Mines, and the Normal School.

Entrance to any of these schools requires at least four years of high school work; and graduation from any of them requires at least four years of college work. Beyond the four years of work leading to the Bachelor's degree, the University also provides opportunities for graduate study, one year of which leads to the Master's degree.

Advantages of this Organization.

The result of this organization, by which at least four years of high school work are required for entrance and at least four years of college work for graduation, is to put the University of Utah upon a footing with the best colleges of the country. Students of the University of Utah enter Cornell, Columbia, Pennsylvania, and Harvard without loss of credits, and students from other universities pursue courses in the University of Utah without fear as to the relative value of the Utah degree.

Which of These Schools to Enter.

The state expects the graduates of its institutions of higher learning to be good citizens. Good citizenship involves ability to earn one's livelihood in a substantial manner. Enthusiasm to help others by one who is himself a burden upon others is not citizenship. The work of the University must therefore be practicable. It must develop the power of the student to do his work in the world. But a State University must not permit its students to be narrow artisans, possessing skill in their particular work but lacking interest in the affairs of their community. As well as ability to work, good citizenship involves ability to live agreeably and helpfully with one's neighbors. Any university and especially a state university must train its students in the larger affairs of life, so that they may have respect for the rights of others and healthy and intelligent interest in all matters pertaining to human welfare.

The schools of the University are alike in aiming to provide this broad training in citizenship. But each pursues its own method and places emphasis in its own way. Students will, therefore, choose that school which meets their own particular needs and directly prepares for the kind of career which they expect to follow.

The School of Arts and Sciences.

Students who wish a general but substantial college training preparatory to a business career, to public service or to work in journalism or preparatory to a later study of some profession, will naturally enter this school. All students in the school select their work under the advice of officers of the school.

The School of Mines.

With the object of training various kinds of engineers, this school offers a variety of courses in engineering. But though each of the courses is designed to prepare those who follow it to pursue some one branch of engineering, they all at all times keep the emphasis upon the underlying principles of engineering practice. A graduate of one course is not, therefore, unfit for practice in the field of some other course. Furthermore, any engineering course is valuable for those who do not intend to follow the engineering profession. The mental discipline, the knowledge of scientific principles and of applied science when it gives may be as valuable to the teacher, the business, and the professional man as to the engineer.

Normal School.

The Normal School is the only institution in the State legally sanctioned to license teachers for the state public schools. This important work it is especially fit to perform. Its supervisors, special teachers, and equipment, which includes both an elementary and a secondary training school, enable it to do work unsurpassed by any other normal school in the country.

Its connection with the State University gives it almost unique advantages. Its students share the library and laboratory facilities, the class room privileges, and the student life of the University with students who are studying for entirely different careers.

School of Medicine.

The School of Medicine offers two distinct advantages to young men and women in Utah who wish to study medicine: (1) The two years of work which it offers may be as well done in the excellently equipped laboratories and under the specially prepared instructors of the University, as in any school in the country; (2) the expense to the student is insignificant in comparison with that elsewhere.

Registration in this department shows that students of Utah are rapidly coming to see the advantage of doing their preliminary work in medicine at home.

Department of Law.

The Department of Law offers the same advantages to Utah students which the School of Medicine offers. Students in both these schools are coming to realize the advantage of doing a part of their professional work in the community in which they intend to practice.

Work of the State Other than Instruction.

The University of Utah aims to be of service to the State in as many fields as possible.

Its laboratories are places for the investigation of subjects of interest to the various industries of the State. Recently exhaustive experiments have been made and the results printed on the value of Utah brick, of Utah macadam rock, and of the methods of constructing and maintaining earth roads; and work now in progress, is testing the value of various kinds of Utah cement.

The Normal School, by law, maintains a teachers' institute department, from which several regularly employed experts go to the teachers' institutes throughout the State, taking to them the results of work in the training schools of the University and keeping them informed of the newer ideas concerning education.

The School of Arts and Sciences holds itself ready to provide lecturers for public meetings in the State and each year conducts several extension courses in the city and elsewhere for persons who cannot regularly register at the University.

The School of Medicine is closely associated with the State Department of Health. State officers and University instructors are in some cases identical and the laboratories of the Medical School are available for necessary tests and experiments of the State Board of Health.

Registration.

The registration at the University at present approaches the nine hundred mark. What makes this number significant is that it includes only the small number of students of preparatory grade which the practice department of the Normal Sesool demands for practice work in teaching high school subjects. The students of collegiate grade are about evenly distributed through the shools of the University with perhaps the advantage, slightly in favor of the School of Mines. Several extension courses in the City, in Springville, in Spanish Fork, in Lehi and in Mount Pleasant contribute a considerable number to the total.

The Spirit of the Student Life.

The University has many students who aim to keep ahead of the assignments specifically made; for this they are not branded as "greasy grinds," a term of opprobium of degree in eastern institutions than "book worms" itself. This is suggestive of the healthful attitude in the student body of the State University.

Student activities have much prominence in the college life at the University. But there are few students who are there for other reasons than to study. Football, basketball, debating, dramatics, and kindred pursuits hold a conspicuous place, and the record of the students in these activities is high, but they meet only a secondary need of a college—that of intelligent recreation. That they may be this they are safeguarded by stringent eligibility rules, which make it impossible for those who will not do their regular work to engage in the supplementary activities. Victory for the football team or success for the dramatic club is no ground for waiving the eligibility requirements. To represent the University in any prominent way, a student must first of all be a satisfactory student in his courses of study.

That the students themselves are giving encouragement to this attitude seems apparent, for in all official acts of the student body, eligibility is taken into consideration. Many a man who would be well suited to a certain office in one of the student organizations has been turned down because he did not come up to the mark in his scholastic work. Prominent students declare that in the long run the organizations are benefted by the stricter requirements.

Altogether, local college authorities do not seem discouraged by the prospects for college life. The old-time "college spirit," in which the greater the deprecation the greater the delight, is giving way before a spirit of a more earnest and a more healthful endeavor. And the "greasy grind," in Utah schools at least, is not looked upon with any degree of contempt.